

CLAIMS

What Is Claimed Is:

- 1 1. A process instrument for measuring pressure of process media in a process, the
2 instrument comprising:
3 a seal connection comprising a base sealed to the process and a body extending
4 from the base to a distal end spaced apart from the base;
5 a pressure sensor located at the base to sense pressure of the process media and
6 transmit a pressure signal indicative of the sensed pressure of the process media; and
7 a pressure gauge positioned at the distal end of the seal connection apart from the
8 pressure sensor and adapted to receive the pressure signal.
- 1 2. The process instrument of claim 1 comprising a transmission conduit connecting
2 the pressure sensor to the pressure gauge, wherein the pressure signal is transmitted via the
3 transmission conduit to the pressure gauge.
- 1 3. The process instrument of claim 2 wherein the body of the seal connection defines
2 a cavity and the transmission conduit is located in the cavity.
- 1 4. The process instrument of claim 3 wherein the cavity is devoid of fill liquid.
- 1 5. The process instrument of claim 2 wherein the pressure signal is an electrical
2 signal and the transmission conduit comprises one or more wires.
- 1 6. The process instrument of claim 1 wherein the base is flush-sealed to the process
2 to form an interface comprising a flush surface.
- 1 7. The process instrument of claim 6 wherein the interface is diaphragm-less
2 between the sensor and the process.

1 8. The process instrument of claim 7 wherein the process sensor comprises a sensor
2 diaphragm.

1 9. The process instrument of claim 1 wherein the pressure sensor comprises a sensor
2 seal in direct contact with the process media.

1 10. The process instrument of claim 1 wherein the base comprises a pocket and the
2 sensor is secured in the pocket.

1 11. The process instrument of claim 1 wherein the gauge is a digital gauge.

1 12. A diagnostic instrument for measuring a parameter of process media of a process,
2 the instrument comprising:

3 a seal connection comprising:
4 a seal-diaphragmless base sealed to the process, and
5 a body extending from the base to a distal end spaced apart from the base;
6 a sensor located at the base to sense the process media parameter and transmit a
7 signal indicative of the sensed parameter; and
8 a diagnostic-output device positioned at the distal end apart from the sensor and
9 adapted to receive the signal indicative of the sensed parameter.

1 13. The instrument of claim 12 wherein the body defines a cavity and the cavity is
2 devoid of fill liquid.

1 14. The instrument of claim 12 wherein the diagnostic-output device is a pressure
2 gauge responsive to electrical signals and the signal indicative of the sensed parameter is an
3 electrical signal.

1 15. A process instrument for measuring pressure of a process media of a process, the
2 instrument comprising:

3 a base sealed to the process;
4 a body extending from the base to a distal end spaced apart from the base,
5 wherein the body defines a cavity devoid of fill liquid;
6 a pressure sensor located at the base to sense pressure of the process media and
7 transmit a signal indicative of the sensed pressure; and
8 a pressure gauge positioned at the distal end apart from the pressure sensor and
9 responsive to the signal indicative of the sensed pressure.

1 16. The instrument of claim 15 wherein the pressure gauge is a digital pressure gauge.

1 17. The instrument of claim 15 comprising one or more wires connecting the pressure
2 gauge and the pressure sensor, wherein the signal indicative of the pressure of the process media
3 is transmitted to the pressure gauge via the one or more wires.

1 18. The instrument of claim 15 wherein the pressure sensor is in direct contact with
2 the process media.

1 19. The instrument of claim 18 wherein the base and the pressure sensor are flush-
2 sealed to the process.

1 20. The instrument of claim 19 wherein the base and the pressure sensor are
2 sufficiently flush-sealed to eliminate substantially all clog-susceptible pockets.

1 21. The instrument of claim 15 wherein the pressure sensor comprises a sensor
2 diaphragm in direct contact with the process media.

1 22. The instrument of claim 15 wherein the base comprises a seal diaphragm between
2 the pressure sensor and the process media and the seal diaphragm is adjacent the pressure sensor.

1 23. The instrument of claim 22 wherein the pressure sensor comprises a sensor
2 diaphragm in direct contact with seal diaphragm.

1 24. The instrument of claim 22 wherein the seal diaphragm is sufficiently flush-sealed
2 to the process to substantially eliminate clog-susceptible pockets.

1 25. A method of measuring pressure of a process media of a process, the method
2 comprising:
3 positioning a pressure gauge apart from the process media;
4 positioning a pressure sensor in operable communication with the process media
5 to sense pressure changes of the process media;
6 positioning the pressure sensor apart from the pressure gauge; and
7 transmitting a pressure signal based on the sensed pressure from the pressure
8 sensor to the pressure gauge.

1 26. The method of claim 25 comprising:
2 sealing a base of a seal connection to the process;
3 positioning the pressure gauge at a distal end of the seal connection;
4 positioning the pressure sensor at a base of the seal connection; and
5 maintaining a fill-liquid-free environment between the pressure sensor and the
6 pressure gauge.

1 27. The method of claim 26 wherein a cavity in a body of the seal connection defines
2 the fill-liquid-free environment; and the method comprises transmitting the pressure signal
3 through the cavity.

1 28. The method of claim 27 comprising transmitting the pressure signal via one or
2 more wires connecting the pressure gauge and the pressure sensor.

1 29. The method of claim 26 comprising positioning one or more wires in a body of
2 the seal connection, wherein the pressure signal is transmitted to the pressure gauge via the one
3 or more wires.

1 30. The method of claim 25 comprising positioning a seal diaphragm between the
2 pressure sensor and the process media.

1 31. The method of claim 30 comprising preventing fill-liquid from separating the
2 pressure sensor and the seal diaphragm.

1 32. The method of claim 25 wherein the pressure sensor is provided with a sensor
2 diaphragm.

1 33. The method of claim 25 comprising placing the pressure sensor in direct
2 communication with the process media.

1 34. The method of claim 25 wherein positioning the pressure sensor apart from the
2 process media comprises connecting the pressure sensor to a distal end of a stem and connecting
3 a proximal end of the stem to the process, the method further comprising positioning the pressure
4 sensor at the proximal end of the stem.

1 35. The method of claim 34 wherein a cavity in a body of the stem defines the fill-
2 liquid-free environment; and the method comprises transmitting the pressure signal through the
3 cavity.

1 36. The method of claim 25 further comprising transmitting the pressure signal via
2 one or more wires connecting the pressure gauge and the pressure sensor.

1 37. The method of claim 34 further comprising positioning one or more wires in a
2 body of the stem, wherein the pressure signal is transmitted to the pressure gauge via the one or
3 more wires.

1 38. A method of measuring pressure of a process media, the method comprising:
2 sealing a base of a seal connection to the process;
3 positioning a pressure gauge at a distal end of the seal connection;
4 positioning a pressure sensor at a base of the seal connection in operable
5 communication with the process media;
6 spacing the pressure sensor apart from the pressure gauge; and
7 transmitting a pressure signal from the pressure sensor via transmission conduits
8 to the pressure gauge.

1 39. The method of claim 34 comprising placing the pressure sensor in direct contact
2 with the process media.

1 40. A process instrument for measuring pressure of process media in a process, the
2 instrument comprising:

3 a pressure gauge stem comprising a proximal end for connecting to a process and
4 a body extending from the proximal end to a distal end;

5 a pressure sensor located at the proximal end to sense pressure of the process
6 media and transmit a pressure signal indicative of the sensed pressure of the process media; and

7 a pressure gauge positioned at the distal end of the pressure gauge stem apart from
8 the pressure sensor and adapted to receive the pressure signal.

1 41. The process instrument of claim 40 comprising a transmission conduit connecting
2 the pressure sensor to the pressure gauge, wherein the pressure signal is transmitted via the
3 transmission conduit to the pressure gauge.

1 42. The process instrument of claim 41 wherein the body of the pressure gauge stem
2 defines a cavity and the transmission conduit is located in the cavity.

1 43. The process instrument of claim 42 wherein the cavity is devoid of fill liquid.

1 44. The process instrument of claim 41 wherein the pressure signal is an electrical
2 signal and the transmission conduit comprises one or more wires.

1 45. The process instrument of claim 40 wherein the interface is diaphragm-less
2 between the sensor and the process.

1 46. The process instrument of claim 45 wherein the process sensor comprises a sensor
2 diaphragm.

1 47. The process instrument of claim 40 wherein the pressure sensor comprises a
2 sensor seal in direct contact with the process media.

1 48. The process instrument of claim 40 wherein the proximal end of the pressure
2 gauge stem comprises a pocket and the sensor is secured in the pocket.

1 49. The process instrument of claim 41 wherein the gauge is a digital gauge.

1 50. A diagnostic instrument for measuring a parameter of process media of a process,
2 the instrument comprising:
3 a stem comprising:
4 a proximal end for connecting to the process, and
5 a body extending from the proximal end to a distal end; and
6 a sensor located at the proximal end to sense the process media parameter
7 and transmit a signal indicative of the sensed parameter; and
8 a diagnostic-output device positioned at the distal end of the stem apart from the
9 sensor and adapted to receive the signal indicative of the sensed parameter.

1 51. The instrument of claim 50 wherein the body defines a cavity and the cavity is
2 devoid of fill liquid.

1 52. A method of measuring pressure of a process media, the method comprising:
2 positioning a pressure gauge at a distal end of a gauge stem;
3 positioning a pressure sensor at a proximal end of the gauge stem;
4 spacing the pressure sensor apart from the pressure gauge;
5 connecting the gauge stem to a process such that the pressure sensor is in operable
6 communication with the process media; and
7 transmitting a pressure signal from the pressure sensor via transmission conduits
8 to the pressure gauge.

1 53. The method of claim 52 comprising placing the pressure sensor in direct contact
2 with the process media.